## Patent claims

1. An air conditioning system, in particular a motor vehicle air conditioning system (1), having a circuit (2) through which refrigerant flows and in which are arranged a refrigerant compressor (3) and a first heat exchanger (4), an inner heat exchanger (5), an expansion element (7) and a second heat exchanger (8), the first heat exchanger (4) serving as a gas cooler in AC operation and the second heat exchanger (8) serving as an evaporator in AC operation, **characterized** in that a device for reversing the flow direction of the refrigerant is provided for heat pump operation, and means are provided which deactivate the inner heat exchanger (5) while the flow direction is reversed.

2. The air conditioning system as claimed in claim 1, characterized in that the means which deactivate the inner heat exchanger (5) while the flow direction is reversed preferably comprise two non-return valves (9).

3. The air conditioning system as claimed in claim 1 or 2, characterized in that the device for reversing the flow direction of the refrigerant comprises a cross-over circuit of the back pressure and high pressure connections on or in the refrigerant compressor (3).

4. The air conditioning system as claimed in claim 2, characterized in that the non-return valves (9) are provided on or in the inner heat exchanger (5).

5. The air conditioning system as claimed in one of the preceding claims, characterized in that the refrigerant compressor (3) can be operated in two directions or a correspondingly acting configuration of lines and valves is provided.

6. The air conditioning system as claimed in one of the preceding claims, characterized in that an expansion element (7) having antiparallel bypasses is provided in the circuit (2).

7. The air conditioning system as claimed in one of the preceding claims, characterized in that the heat exchanger (8) which serves as an evaporator in AC operation functions as a heater in heat pump operation.

8. The air conditioning system as claimed in one of the preceding claims, characterized in that $CO_2$ is used as the refrigerant.

9. The air conditioning system as claimed in one of the preceding claims, characterized in that a compressor regulator valve and a device for switching the refrigerant flow direction are electrically controlled.

10. The air conditioning system as claimed in one of the preceding claims, characterized in that the stroke volume of the refrigerant compressor (3) is adjustable.

11. A method for operating an air conditioning system (1) as claimed in one of claims 1 to 10, the refrigerant flowing through the circuit (2) counter to the normal flow direction, and the

inner heat exchanger (5) being bypassed, during heat pump operation.